Welcome

Malcolm Beeler

Member, Leadership Team
EBC TSCA & Emerging Contaminants Committee

PCB Technical Lead, Weston & Sampson
Introduction and Program Overview

Malcolm Beeler

Program Co-Chair and Moderator

PCB Technical Lead, Weston & Sampson
Preparing for Rail Shipments

November 7, 2019
Disposal Outlets in New England

- Increased difficulty to source disposal location
- Limited Space
- Less Landfills in region
- Subtitle D has flow restrictions which is causing backup in market
- NE Approval process is stringent
- Ability to maintain production on projects
Rail Overview

• How many have shipped via rail

• Are we unsure to ship via rail
**Cons**

- Unknown of shipping – not going on a truck direct to landfill
- Out of contractor’s control once on the rail
- Loads typically take longer to reach disposal facility
  - based on end location and train departure
- Getting rates can requires releases from both starting location and receiving location
- Credit will not be extended (very short credit terms)
- Short loads can be costly since pricing is based on a per car basis.
Pros

• Organized
  Rail has fixed routes and follows a schedule, so you can constantly monitor your cargo’s location.

• Quick
  Rail usually travels longer distances with fewer stops than trucks, especially when traveling far distances.

• Versatile
  Not only is rail capable of moving heavy and bulky items between destinations, volume needs are met by adding more cars to the train.
Pros (cont.)

- Dependable
  It is not as easily influenced by weather conditions like other modes of transportation (heavy rain, fog, and even snow)

- Environmentally Friendly
  Railroads are four times more fuel-efficient than trucks. They also lower greenhouse gas emissions, reduce highway congestion, and even reduce pollution.

- Cost Effective
  Can move more cargo with one train than you can with one truck. Can instantly save on freight costs, Number of loads per day delivered to trans-load facility will likely be greater than the number of trucks obtained to ship direct
Key Locations Specific to Environmental Work

- Red Tech - Portland
  - TSDF with bulk loading capabilities into gondolas

- Strategic Trans Loading - New Haven
  - Non-hazardous via Gondolas
  - Hazardous via intermodals
Commodity Transporters

CSX

Providence & Worcester

Naugatuck Railroad

Housatonic Railroad Company
Available End Facilities

- Non-Hazardous – Subtitle D
  - Republic - Niagara
  - Tunnel Hill
  - WM High Acres

- Hazardous
  - Heritage
  - USE
  - WM Emelle
**Long-Haul Trucking Shortage**

- America's Massive Truck Driver Shortage May Triple by 2026: Experts
  The Street (7-16-2018)
- Drivers Wanted: Why the Trucking Shortage Is Costing You
  Fortune (8-1-2018)
- How Bad?
  - Current estimates range from 48,000 – 60,000+ – TODAY!
  - 2024 estimates exceed 200,000!
- Why?
  - E-Logs; Tough lifestyle; for HazMat – Rolling ATM for USDOT inspections
Planning for Rail Shipments

- Expected volume of TSCA (> 50 ppm) is a critical component.
- Plan for Constructing a Soil Storage area for PCB soil
- 40 CFR 761.65(b)(9) says:
  Bulk PCB remediation waste or PCB bulk product waste may be stored at the clean-up site or site of generation for 180 days subject to the following conditions:
  - Is the site rail served?
  - Is the switch still there and operable?
  - Few sites will have both!
Planning for Rail Shipments

• If rail served and useable

Gondolas may be an option

Intermodals may be an option
Planning for Rail Shipments

- Length of available track?
- Number of switches per week?
- What railroad services site?
- Area adjacent to track?
- How much room?
Gondola Cars

- If NOT Rail Served?
- Transload Facility Needed
- Typically 100 – 108 tons
- Debris at site?
  - Sizing restriction – Chute
  - Typically 12”
- Trucks run Overweight?
- Site location is Key
Gondola Cars
Intermodals

28 CY Capacity – 20’ (L) x 8’ (W) x 6 ½’ (H)
Intermodals
Safety - Scaffolding for Intermodals
RFP Preparation

• Plan for the potential for erecting & manning scaffolding
  • Could be an “Add-In or Deduct-Out” line item.
• Plan for steady daily shipments
  • Breaks in continuity are okay to recharge stockpile
• Manage remedial contractor expectations as to daily volume
• Involve TSD’s with rail capability in planning phase
• Scaffolding clearances: Typically 20’ (L) x 11’ (W)
• Trucks can drive thru or back in if space is limited
Planning for Rail?

• Stockpiles are most effective.
• Final loadouts should be after post-excavation samples
  • Re-mobilizing for a ½ dozen loads can be problematic.
  • Typically 6 containers per railcar
  • May need to long-haul a few loads.
• Minimum of two (2) weeks to mobilize railcars for a project.
• Communication is KEY! – Especially large volume projects
• Intermodals much more flexibility for projects.
**Understanding the Math!**

- Site in Providence, RI
- Miles to nearest TSCA landfill = 785 miles
- USDOT – 11 hours of drive time per day
- Move 300 ton/day = **13** Trucks @ 23 tons each
- Two (2 1/2) day run (Out & Back) Need **32** Long-haul HazMat Trucks
- Using IM’s – Four (4) trucks make Three (3) turns per day
- Only need **Four (4)** trucks!
Questions?

Pete Long
Heritage Environmental Services

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Thank you for your time!
Thermal Desorption of PCBs as an Alternative Disposal Technology

Scott Miller
Region General Manager, New England
Clean Earth, Inc.
EBC Connecticut
Alternative Method to Dispose PCB Remediation Soil by Low Temperature Thermal Desorption
Alternative Method to Dispose PCB Remediation Soil by LTTD

Presentation Summary

1. Who is Clean Earth?
2. Thermal Desorption Overview
3. PCBs and Thermal Treatment
4. CECT Demonstration History
5. PCB Treatment Demonstration Protocol
6. Demonstration Test Results
7. EPA Approval
8. What’s Left To Do?
Our network of full-service treatment, disposal, and recycling locations provides the best solutions for our customers.

Recently Acquired by:
HARSCO Corporation
About Clean Earth

Treatment & Recycling Facts

~98% of the material we process is recycled

4 Million tons recycled in 2018

7 Million yd³ dredged material recycled since 1996

8 Million pounds of aerosol products recycled in 2018

25 reclaimed industrial brownfields & former landfills
**Clean Earth of Connecticut**

<table>
<thead>
<tr>
<th>Treatment Platform</th>
<th>Low Temperature Thermal Desorption (LTTD)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Thermally treats up to 215,000 tons per year of non-hazardous soil and sediment to <strong>below Res DEC and GA PMC concentrations</strong></td>
</tr>
</tbody>
</table>

| Capacity | • 800 tons daily of non-hazardous soil  
 | • Storage capability up to 6,000 tons |

| Receiving Hours | 7:30 a.m. to 4:00 p.m., Monday – Friday |

| Acceptable Material | Non-Hazardous Soils and Sediments  
 | “Contained-In” Soils  
 | PCBs <50ppm, non-TSCA |

| Treated Soils | Beneficially reused per Beneficial Use Determination (BUD) |

Soil are NOT disposed – Soils are Beneficially Reused
Clean Earth of Connecticut
Thermal Treatment Operating Principles

What is Low Temperature Thermal Desorption (LTTD)?
• < 1,000 °F (>1,000 °F = incineration)

Utilizes heat to physically separate contaminants from soil
• Rotary Kiln (volatilization and steam stripping)
• Volatilization (temperature ranges from 550-900 °F)

Contaminants in gas stream are thermally oxidized
• Thermal oxidation (range from 1,500-2250 °F)
• Immediate quench of gas stream (to 420 °F)
• Bag house (particulate removal)
• Effluent stack (CECT equipped with wet scrubber)

*Effluent stack discharges less emissions than your car
Thermal Treatment Process Diagram
Thermal Treatment Process

Maximum Concentrations of Contaminants into PTU by Permit

- Total Petroleum Hydrocarbons (TPH) < 10,000 mg/kg (can receive < 100,000 mg/kg)
- PCBs (non-TSCA) < 40 mg/kg (can receive < 50 mg/kg)
- Total Halogenated Solvents < 50 mg/kg (can receive < 1,000 mg/kg)
- Coal Tar Pitch Volatiles < 275 mg/kg
- Mercury < 0.49 mg/kg
- Total Cyanides < 30.1 mg/kg (can receive < 200 mg/kg)
- Total Chromium < 400 mg/kg (can receive < 5 mg/l by TCLP)
- Chlorine < 50 mg/kg (can receive < 0.2 mg/l by TCLP)
Thermal Treatment Process

Primary Treatment Unit (PTU) or Rotary Kiln

- Drum Diameter 8 feet, Length 40 feet
- 280 flights inside drum
- 34 MMBTU Astec Burner
- Temperature range from 550°F to 900°F
- Retention Time in PTU of 12 minutes
Thermal Treatment Process

Secondary Treatment Unit (STU) or Thermal Oxidizer

- 26 MMBTU Astec Burner
- Temperature range from 1500°F to 2250°F

- Retention Time of Gas Stream ≥ 2.0 Seconds at temperature in Oxidizer
Thermal Treatment Process

Countercurrent Packed Bed Wet Scrubber

- 144” Tellerette Packed Bed Tower
- 60,000 scfm exhaust Treatment Capacity
- Approximately 600 gpm recirculated water flow
- > 99% Removal Efficiency formed Acids (HCL > 99.99%)
- Maintaining pH > 8.0 using Sodium Hydroxide Solution reducing carbon dioxide (greenhouse gas)
Thermal Treatment Process

Continuous Emissions Monitor (CEM)

- Horiba Continuous Emission Monitoring Analyzer
- Monitors CO and O₂
- Pollutant Operating Parameter Emission Limits
  - CO @ O₂ ≤ 14% allowed at 100 ppmvd
  - CO @ O₂ > 14% allowed at 50 ppmvd
- Annual Stack Emissions Test and RATA
PCBs and Thermal Destruction

Chemical Structure of PCBs
Polychlorinated Biphenyls (PCBs) Chemical Properties

- 209 possible congeners based on the positions of chlorine atoms
- Congeners with the same number of chlorine atoms, but in different positions are termed isomers
- PCBs are either oily liquids or solids and are colorless to light yellow in color.
- PCB mixtures are known by their industrial trade names, such as Aroclor and Askarel.
Polychlorinated Biphenyls (PCBs) Chemical Properties

- Boiling temperature = 340 – 375 °C or 644 – 707 °F
- Incineration temperature is approximately 1,000 °C or 1,832 °F with a 2 second retention time
- PCBs thermally oxidized into CO$_2$, chlorine and water
History of Approval Process

- April 1, 2014 – Demonstration Test Plan Application Submitted to EPA Region 1
- July 1, 2015 – EPA approves Demonstration Test Plan
- April 12&13, 2016 – Demonstration Test Plan performed
- June 2016 – Demonstration Test Plan Report submitted to EPA Region 1
- April 1, 2017 – Application for PCB Destruction Utilizing Low Temperature Thermal Desorption Treatment Technology submitted to EPA Region 1
- May 31, 2018 – EPA Region 1 Response and Comments Issued
- September 6, 2018 – Revision 1 of Application Submitted
- October 10, 2018 – Sit Down Meeting with EPA Region 1 to review final comments
- November 9, 2018 – Revision 2 of Application Submitted
- November 13, 2018 – EPA Opens Public Comment Period on Application (Closes December 13)
- December 14, 2018 – EPA Region 1 issues “Approval of Alternative Method to Dispose of PCBs by LTTD
Proposed LTTD Demonstration Test Plan Protocol

- Demonstration Objective: 99.9999% Destruction Removal Efficiency (DRE) or six 9’s in stack emissions
- Surrogate Contaminant: 1,2 Dichlorobenzene (incinerability twice as hard than PCBs)
- Spike Concentration: 100 ppm (blend of #2 fuel oil and 1,2 DCB)
- Spike Procedure: metering pump of 4.65 gph sprayed onto soil entering PTU to achieve 5.0 lb/hour spike rate
- Duration of Each Test: 240 minutes at 25 tons per hour
- Parameter Testing;
  1. Stack Emissions*
  2. Baghouse Ash**
  3. Scrubber Water**
  4. Treated Soil**

* MDL of stack emission testing @ 20 ng/l
** Note Detection Limit for these parameters @ 1 ppm limiting reportable DRE to 99.999%
Actual LTTD Demonstration Test Plan Results

Testing Performed on April 12 and 13, 2016
Actual Measured Parameters
• Average Surrogate (1,2 Dichlorobenzene) Spike Concentration @ 158.02 mg/kg
• Average Soil Treatment Rate was 22.16 tons per hour
• Average PTU temperature of 729°F
• Average STU temperature of 2,200°F
• Testing Results;
  1. Average 1,2 DCB Stack Emission of 8.3x10^-6 lb/hr or DRE of 99.9999%
  2. Dioxin/Furans emissions BDL
  3. HCL emissions BDL
## Actual LTTD Demonstration Test Plan Results

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Date</th>
<th>Time</th>
<th>Limit (^1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>04/12/16</td>
<td>11:15-15:50</td>
<td>0.00019</td>
</tr>
<tr>
<td></td>
<td>04/13/16</td>
<td>08:45-13:08</td>
<td>0.00012</td>
</tr>
<tr>
<td></td>
<td>04/13/16</td>
<td>13:28-17:44</td>
<td>0.00015</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>99.998%</td>
</tr>
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### Process Data

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>STU Temperature (°F)</td>
<td>2203.3</td>
<td>2209.5</td>
<td>2192.2</td>
<td>2201.7</td>
</tr>
<tr>
<td>Soil Treatment Rate (TPH)</td>
<td>22.337</td>
<td>22.835</td>
<td>21.292</td>
<td>22.155</td>
</tr>
<tr>
<td>Exhaust Gas Flow (dscfm)</td>
<td>10240</td>
<td>10991</td>
<td>10297</td>
<td>10509</td>
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</table>

### PCBs Surrogate Spiking Data\(^4\)

<table>
<thead>
<tr>
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<th>3</th>
<th>Average</th>
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<tbody>
<tr>
<td>Soil Treatment Rate (tph)</td>
<td>22.337</td>
<td>22.835</td>
<td>21.292</td>
<td>22.155</td>
</tr>
<tr>
<td>Concentration (ppm) Surrogate</td>
<td>171.23</td>
<td>123.19</td>
<td>179.64</td>
<td>158.02</td>
</tr>
<tr>
<td>Spiking Rate (lb/hour)</td>
<td>7.65</td>
<td>5.63</td>
<td>7.65</td>
<td>6.98</td>
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</table>

### PCBs Surrogate Emissions - EPA 0010

<table>
<thead>
<tr>
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<th>Average</th>
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</thead>
<tbody>
<tr>
<td>Emission Rate (g/Kg)</td>
<td>0.00086</td>
<td>0.00149</td>
<td>0.00134</td>
<td>0.001</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>6.55E-06</td>
<td>8.58E-06</td>
<td>9.77E-06</td>
<td>8.30E-06</td>
</tr>
<tr>
<td>Destruction Efficiency (%)</td>
<td>99.99991%</td>
<td>99.99985%</td>
<td>99.99987%</td>
<td>99.9999%</td>
</tr>
</tbody>
</table>

### Dioxins/Furans (Total) - EPA 23A

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Concentration (ng/dscm)</td>
<td>0.26307</td>
<td>0.11208</td>
<td>0.09403</td>
<td>0.15639</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>1.01E-05</td>
<td>4.62E-06</td>
<td>3.63E-06</td>
<td>6.12E-06</td>
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</table>

### Total Organic Chloride Emissions - Methods 0010 and VOST

<table>
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<tr>
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<th>Average</th>
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</thead>
<tbody>
<tr>
<td>Concentration (ug/acm)</td>
<td>2.59</td>
<td>6.80</td>
<td>4.40</td>
<td>4.60</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>2.30E-04</td>
<td>6.50E-04</td>
<td>3.90E-04</td>
<td>4.23E-04</td>
</tr>
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</table>

### Particulate Emissions

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<tr>
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<th>1</th>
<th>2</th>
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<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concentration (gr/dscf at 7% O(_2))</td>
<td>0.0013</td>
<td>0.0009</td>
<td>0.0004</td>
<td>0.0009</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>0.119</td>
<td>0.085</td>
<td>0.039</td>
<td>0.081</td>
</tr>
<tr>
<td>HCl Emissions</td>
<td>&lt;0.17</td>
<td>&lt;0.17</td>
<td>&lt;0.17</td>
<td>&lt;0.17</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>&lt;0.011</td>
<td>&lt;0.011</td>
<td>&lt;0.011</td>
<td>&lt;0.011</td>
</tr>
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### NO\(_x\) Emissions

<table>
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<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Average</th>
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</thead>
<tbody>
<tr>
<td>Concentration (ppm-dry)</td>
<td>88.24</td>
<td>83.84</td>
<td>85.13</td>
<td>85.74</td>
</tr>
<tr>
<td>Emission Rate (lb/hour)</td>
<td>6.474</td>
<td>6.602</td>
<td>6.280</td>
<td>6.452</td>
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</table>

### Combustion Efficiency

<table>
<thead>
<tr>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>CO(_2) Concentration (%)</td>
<td>7.55</td>
<td>7.54</td>
<td>7.33</td>
<td>7.47</td>
</tr>
<tr>
<td>CO Concentration (%)</td>
<td>0.00014</td>
<td>0.00019</td>
<td>0.00012</td>
<td>0.00015</td>
</tr>
<tr>
<td>Combustion Efficiency (%)</td>
<td>99.998%</td>
<td>99.997%</td>
<td>99.998%</td>
<td>99.998%</td>
</tr>
</tbody>
</table>

\(^1\) Limit values are based on regulatory guidelines and standards. They indicate the maximum permissible levels for each parameter.
Clean Earth of Connecticut (CECT) receives “Approval of Alternative Method to Dispose of Polychlorinated Biphenyls (PCBs) by Low Temperature Thermal Desorption (LTTD) – Authorizing CECT to operate its LTTD, an alternative disposal method, to destroy non-liquid PCBs in soil and sediment”
CECT Approval Permit Parameters

- Pretreatment Storage of 2,640 cyds of < 50 ppm Remediation Waste Soil and Sediment
- Oversized Rock (>2”) crushed prior to treatment
- Debris managed offsite in accordance with 40 CFR 761.61(a)(5)(i)(B)(2)(ii) or (iii)
- Presample feedstock to confirm ≤ 40 ppm PCBs
- Hourly grab samples composited every 24 hours & analyzed as a confirmatory sample (one sample per 500 tons)
- PTU temperature minimum of 729°F, STU temperature minimum 2,200°F (Rolling Hourly Average)
- Measure, calculate and record combustion gas flow rate confirming ≥ 2 second at 2,200°F
- All permit required data maintained per batch of PCB treatment
- CECT to prepare and provide Certificates of Disposal for PCB customers per 40 CFR 761.218
So, can we accept your PCB Remediation wastes? Not yet...

There is still some work to do and approvals to get...

1. CECT has submitted a modification to our Connecticut DEEP Bureau of Air Management (BAM) permit to increase our STU temperature range to 2,250°F
2. CECT has requested an administrative letter from the CT DEEP Waste Engineering and Enforcement Division (WEED) to eliminate restriction language in our 22a-454 permit to allow receipt of TSCA Remediation Waste per the EPA approval
3. CECT has ordered a new CEM analyzer for the continuous detection and data logging of CO₂ concentrations in our stack emissions per the EPA approval
4. CECT in the process of designing and procuring dedicated crushing and picking equipment to process TSCA remediation waste prior to batch treatment
5. CECT designing new PLC logic program to measure, calculate and maintain all TSCA PCB parameters in accordance with the EPA approval requirements when treating PCBs
Questions?

Contact Me with Questions

Scott A. Miller, P.E.
Regional General Manager, New England

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Disposal of Metal with PCB Paints

David McCarley

Program Co-Chair and Moderator

Business Development Manager
Northeast United States, Clean Harbors
A CONTRACTOR’S PERSPECTIVE ON BULK PCB REMEDIATION WASTE: PAINTED STEEL

David McCarley, Technical Services Business Development Manager, Northeast United States, Clean Harbors
CONTENT

- PRESENTATION OVERVIEW
- REGULATORY CONSIDERATIONS
- CHANGES TO DETERMINATIONS
- SUMMARY
PCB Remediaion Waste Definition, 40 CFR 761.3

“PCB remediation waste means wastes containing PCBs as a result of a spill, release, or other unauthorized disposal, at the following concentrations: Materials disposed of prior to April 18, 1978, that are currently at concentrations ≥ 50 ppm, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥ 500 ppm PCBs beginning on April 18, 1978 or ≥ 50 ppm beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under this part.
Regulatory Considerations

The cleanup provisions in 40 CFR 761.61 apply only to PCB remediation wastes as defined in 40 CFR 761.3. For purposes of cleanup and disposal under 40 CFR 761.61, PCB remediation waste is divided into four general waste types:

- bulk PCB remediation wastes;
- non-porous surfaces;
- porous surfaces; and
- liquid PCB remediation wastes.

761.61 also provides decontamination or disposal options for cleanup wastes (e.g., wastes generated during cleanup such as used personal protective equipment).
Regulatory Definitions

PCB Remediation Waste: Waste containing PCBs because of a spill or the leaching of PCB Source Material. PCB remediation waste includes items such as soil, concrete, wood.

The PCB Disposal Amendments or “MegaRule”: established cleanup standards and procedures for certain PCB contaminated material associated with historic spills, that is, spills for which responsive action has not occurred in accordance with EPA spill policy.
Federal and State Regulations for Building Materials containing PCBs at or above 50 ppm that were manufactured with PCBs (e.g., caulk, joint sealants, paint) fall under the category of PCBs bulk product wastes. See 40 Code of Federal Regulations (CFR) 761.3 for a definition of PCBs bulk product wastes.
Regulatory Considerations

Building materials such as concrete, brick, and metal contaminated with PCBs are PCBs remediation wastes (e.g., concrete contaminated with PCBs from caulk or steel coated by PCBs that contains PCBs). 40 CFR 761.3 defines PCBs remediation wastes.

Disposal of PCBs wastes is subject to TSCA requirements such as manifesting of the waste for transportation and disposal. See 40 CFR 761 and 40 CFR 761, Subpart K.

TSCA-regulated does not equate solely to materials containing PCBs at or above 50 ppm. There are circumstances in which materials containing PCBs below 50 ppm are subject to regulation under TSCA. See 40 CFR 761.61(a)(5)(i)(B)(2)(ii).
PCB Paint/Steel Remediation Waste Presentation

**Regulatory Considerations**

PCB Bulk Product Waste may be disposed of in a solid waste landfill but it must be permitted, licensed, or registered by a State as a municipal or non-municipal non-hazardous waste landfill.

PCB Remediation Waste may be disposed of either through self-implementing onsite cleanup and disposal, which allows residual concentrations to remain in a building depending on property use characteristics and PCB disposition, performance-based disposal in a TSCA incinerator or chemical waste landfill, or a regulated decontamination procedure.
EPA does not require prior approval for either primary disposal option for PCB bulk product waste or PCB remediation waste, but either may also be disposed of through a risk-based disposal method outside these options if the EPA certifies it does not pose unreasonable risk to public health or the environment.
Regulatory Considerations

The Problem?

- PCB caulking, paint, mastics, and sealants, which as the source of contamination contain the higher levels of PCBs, are allowed to be disposed of as Bulk Product Waste.

- PCB contaminated building materials are required to be managed as Remediation Waste.
In 2012, EPA reinterpreted its definitions so building materials “coated or serviced” with PCB materials like caulk, mastics, or sealants can also be handled as PCB bulk product waste. Building materials like concrete or wood where PCBs may have leached into over time may also be considered PCB remediation waste, even if the PCB surface application has been removed.
Regulatory Considerations

EPA PCB Guidance Reinterpretation

In a nutshell...

Allows building material (i.e., substrate) “coated or serviced” with PCB bulk product waste (e.g., caulk, paint, mastics, sealants) at the time of disposal to be managed as a PCB bulk product waste, even if the PCBs have migrated from the overlying bulk product waste into the substrate.
Regulatory Considerations

What if Caulking or Paint is Removed?

If the substrate is not "coated or serviced" (i.e., the PCB bulk product waste, such as caulk or paint has been removed from the building material) at the time of disposal and the substrate is contaminated with PCBs that have migrated from the bulk product waste (or from another unauthorized disposal), the substrate would be considered a PCB remediation waste.

• Note: In many ways it is similar to the Lead Paint disposal policy:
  – If “firmly bonded to the substrate” - Demolition Debris;
  – If “not attached to the substrate” – Industrial or Hazardous Waste Debris
Regulatory Considerations

DEEP has developed a guidance table in conjunction with EPA Region 1

- compares remediation and disposal options for caulking material contaminated with PCBs and associated substrates;
- although specific to caulk, the table can generally be applied to other building materials that contain PCBs;
- in many cases, state and federally regulated PCB contaminated building materials are found in conjunction with one another;
- characterization of building materials should be consistent with the requirements of 40 CFR 761 as well as Connecticut requirements.
## CONNECTICUT DEEP CAULK GUIDANCE

**DISCLAIMER:** THIS CHART IS NOT INTENDED TO REPLACE THE CT DEEP STATUTES OR THE PCB REGULATIONS UNDER 40 CFR PART 761.

<table>
<thead>
<tr>
<th>Renovation</th>
<th>Caulk ≥ 50 parts per million (ppm) PCBs (EPA)</th>
<th>Caulk &lt; 50 ppm PCBs (CT DEEP) (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate</td>
<td>Remove all caulk ≥ 50 ppm</td>
<td>Remove caulk &gt; 1 ppm – 49 ppm</td>
</tr>
<tr>
<td></td>
<td>Test, and if &gt; 1 ppm, clean up per 40 CFR § 761.61 and § 761.62 (2)</td>
<td>Test, and if &gt; 1 ppm, seal/encapsulate substrate as interim measure and obtain annual exemption per CGS 22a-466 or remove all substrate with &gt; 1 ppm.</td>
</tr>
</tbody>
</table>

| Non-renovation | Remove all caulk ≥ 50 ppm and dispose in accordance with 40 CFR § 761.62 |
|                | Encapsulate/seal any caulk > 1 ppm and < 50 ppm, have a plan to address at later date, and perform annual monitoring for effectiveness of encapsulant. DEEP recommends removal as soon as possible. |

| Substrate | Test, and if > 1 ppm, clean up per 40 CFR § 761.61 and § 761.62 (2) | Test, and if > 1 ppm have plan to address at later date. |

| Full demolition | Remove caulk ≥ 50 ppm and dispose in accordance with 40 CFR § 761.62 | Remove caulk < 50 ppm |

### Substrate
- If building substrate is >1 ppm, remove with caulk and dispose in accordance with 40 CFR § 761.62;
  - a RCRA hazardous waste landfill
  - a TSCA-approved disposal facility
  - a solid waste landfill permitted under § 40 CFR Part 258 (RCRA title D) (for CT facilities, a special waste authorization may be required);
  - facilities permitted to manage non-hazardous waste subject to 40 CFR 257.5 -257.30
- If substrate > 1 ppm - 49 ppm, dispose at:
  - A solid waste landfill permitted under RCRA title D (for CT facilities, a special waste authorization may be required);
  - Bulky waste landfill (for CT facilities, a special waste authorization may be required);
  - facilities permitted to manage non-hazardous waste subject to 40 CFR 257.5 -257.30
  - a RCRA hazardous waste landfill

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(1) Caulk < 50 ppm PCBs which meets the definition of an Excluded PCB Product at 40 CFR 761.3, is generally regulated by CT DEEP pursuant to CGS. Caulk that does not meet the criteria for an Excluded PCB Product may be regulated under 40 CFR Part 761 as a PCB Remediation Waste (EPA). An example of a PCB Remediation Waste would be replacement caulk that was installed in 1990 and was contaminated by contact with a PCB-contaminated substrate where the original caulk was ≥ 50 ppm PCBs. Cleanup of PCB Remediation Waste would be regulated under 40 CFR § 761.61.

(2) Under the October 24, 2012 PCB Bulk Product Waste Reinterpretation, building substrates may be disposed of with attached caulk as a PCB bulk product waste in accordance with § 761.62. Building substrates remaining in place (after caulk/substrate removal) are classified as a PCB remediation waste and regulated for cleanup under § 761.61.
Regulatory Considerations

What if Caulking or Paint is Removed (General)?

Demolition debris containing PCB contaminated caulk, paint, and related construction materials, and debris contaminated by contact with such materials, can be disposed without hazardous waste evaluation for PCBs into any solid waste landfill permitted by the State Environmental Regulatory Agency or by its state of location, including in permitted demolition, municipal solid waste, and industrial waste landfills.
Regulatory Considerations

What if Caulking or Paint is Removed in CT?

If paint is removed, then the stripped paint becomes Remediation Waste as does the non-porous steel that was in contact with the paint.

So not only do you lose the Bulk Waste designation for management, you have more waste streams to manage for disposal.
First consideration is the type of remediation you pursue:

- Self-Implementing Cleanup Under 40 CFR 761.61(a);
- Risk-Based Disposal Approval Under 40 CFR 761.61(c);
Regulatory Questions for Disposal

In general, a site with PCB contamination resulting from a spill, release or other unauthorized disposal is subject to cleanup and disposal in accordance with 40 CFR 761.61, though the date of the spill or release, the PCB concentration of the source, and the PCB concentration of the contaminated material may impact the applicability of cleanup and disposal obligations.

- Is this a PCB Remediation Waste?
- Is it MegaRule?
- Is this a Bulk Waste?
- Concentration of PCBs?

PCB Facility Approval Streamlining Toolbox (PCB FAST)

Thank You
Decontaminating Dewater Effluent at a PCB Remediation Site

Malcolm Beeler

Program Co-Chair and Moderator

PCB Technical Lead, Weston & Sampson
Handling Water During PCB Remediations

EBC
November 7, 2019
Eversource Campus, Berlin, CT
• Aqueous wastes can complicate PCB remediation projects

• Pre-planning is important

• Water is decontaminated

• But how or where?
Agenda

• Planning
• Limiting Generation
• Handling and Storage
• Discharge
Planning

- Sources
  - Groundwater Infiltration
  - Stormwater
  - Aqueous Decontamination Wastes
Planning

• Regulations - 761.79(b) Performance-Based Decontamination
  – \( \leq 0.5 \, \mu g/L \) unrestricted
  – \(<3.0 \, \mu g/L\) discharge to permitted treatment works
    • CT DEEP limit is \(<1.0 \, \mu g/L\)
  – \( \geq 3.0 \, \mu g/L\) incineration
  – Two-phase
    • Separate or dispose at higher concentration phase
Limiting Generation

- Sheet Pile
  - Pre-excavation verification sampling
  - Install in clean if possible
  - Get designed and stamped
Handling and Storage

- Pump
- Quick but expensive
- Rain Event
- Send to Decontamination Facility or Incineration
Handling and Storage

- Pump and Store
- Filter
- Sample
- Discharge
Handling and Storage

- Pump, treat, store
- Proper design allows for multiple discharge options
- Sample
- Discharge
Discharge

- Truck to permitted facility
- Discharge to sanitary sewer
- Discharge to surface water
- Discharge to groundwater
Discharge

- Transport offsite
- Expensive but good for small quantities
- Always feasible
- May be desirable for aqueous decontamination wastes
  - PODFs are flammable
Discharge – CT DEEP GP

- Sanitary Sewer
- Is there local capacity
- Affects rate and total amount
- Permit requirements
- PCBs <1.0 µg/L
- Can’t use standard groundwater tests
Discharge – CT DEEP GP

- Surface Water or Groundwater
- Permit requirements
- PCBs <0.1 µg/L
- As <0.021 µg/L
- Can’t use standard groundwater tests
Questions?
Moderated Discussion

Moderator: David McCarley, Clean Harbors

Panelists:
- Malcolm Beeler, Weston & Sampson
- Ross Hartman, Strategic Environmental Services
- Pete Long, Heritage Environmental Services
- Scott Miller, Clean Earth